

APPENDIX I.

(a.) HEAD OFFICE DRAUGHTING BRANCH.

PUBLICATION OF MAPS.

During the year the Department paid £1,893 9s. 6d. for the printing of maps, not including sale plans and accessory or illustrative maps. For this sum 134 standard maps were issued, being either new maps or reissues, and being at the rate of 2.6 maps per week. In last year's report it was shown that a rate of three per week is required to keep map stock merely level without beginning on the large number of new maps as yet undrawn but badly required. That report also showed that we were falling behind at the rate of two maps per week, and the above figures show that we are still falling behind. As a matter of fact, at the rate of three per week the year ends with a stack of eighty-odd maps—thirty weeks' work on hand with fresh work coming in all the time equal to the full output, so that arrears are increasing. The printing of maps under present conditions is a "bottle-neck," congesting all the avenues of work.

The revenue in cash derived from the sale of maps during the year was £817, while the various Departments of Government used £1,000 worth of maps. If it were possible to print all the maps which the staff can turn out, and which are sorely needed, and to use improved methods of production and sale, the revenue should be easily doubled. There are indications that private printing firms are beginning to wake up to the existence of an unsatisfied market, all the maps for sale in book-sellers shops are local or outside publications, not Government.

Only one notable map was published during the year—the long-delayed topographical map of Dunedin with contours. The promised City of Auckland sheet is still in proof stage.

An attempt has been made to issue specimen maps, especially of topographical drawing, for the guidance of student draughtsmen, but these are still in the before-mentioned "bottle."

"Town" plans coming in for the approval of the Minister keep up their number. A very marked feature of this work, however, is the agitation caused by the demand for reserves for public purposes where the circumstances require such provision. In the majority of cases this is met at once, more than is asked for being given voluntarily; in other cases, however, a great deal of protest has been made, up to the length of a test case in Court, in which the power to require these reserves has been fully maintained.

Legislation to amend procedures and render them more flexible and efficient has been prepared for a considerable time, but has not been accepted by the Government, new law on the policy aspect of the question being considered desirable.

DRAUGHTSMEN'S EXAMINATION.

This examination was held in July, thirteen candidates sitting; two passed in advanced computations, two in second-grade computations, and two in second-grade draughting. The purpose of this examination and the conditions under which it is prepared and held require attention and organization. It is primarily intended to encourage draughtsmen and computers to fit themselves for higher and better-paid work, and to be a substitute for the Matriculation Examination in grading from class to class. The preparation of the papers and subsequent assessment of the results—a very considerable and ungrateful task—is left to two or three officers wholly after hours—officers who as time goes on are in the nature of things more and more removed from first-hand touch with the minutiae and details dealt with. The best system undoubtedly would be that an Inspector of the technical branches, in consequent close touch with all the details and able to set and examine papers unhampered by attention to other work for all the working-hours of the day, should be mainly responsible. Improvements could be made also in the methods—the black-and-white plan, for instance, should be of the same locality for all candidates, and they should also be enabled to make these plans in daylight hours.

OTHER WORK.

The cost of descriptions, maps, and other kinds of work done at Head Office for other Departments amounted to £669.

(b.) REPORT BY E. J. WILLIAMS, TIDE-COMPUTER.

COMPUTATION AND REDUCTION OF OBSERVATIONS.

During the year under report the tidal curves of the self-registering tide-gauge records of the standard ports of Wellington, Bluff, and Westport have been reduced by harmonic analysis. The tidal constants deduced from the above reductions are shown in Table C.

From the harmonic analysis of the measured hourly heights of the tide-gauge records of any port extending over a period of 370 days is obtained one value of H (semi-range) and one value of K (epoch) for each component for each year of hourly heights analysed.

For the larger tides, M2, S2, &c., the values obtained are fairly concordant. In the smaller tides, however, on account of tidal observations not being exactly in agreement from year to year, there are considerable discrepancies. Therefore it is necessary to extend the observations over a number of years, and to accept the mean of the values of H and K for each tide for the completed year of analysis as to the best result.

ERRORS IN PREDICTIONS.

The predicted times and heights for high and low water for the year 1921 as given in the tide-tables have been compared against the actual values obtained from the self-registering tide-gauge records of the standard ports of Auckland, Wellington, Bluff, and Westport. The object of the